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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/863,709	05/23/2001	Pierre Dobrovolny	7096 CIP	1492
7590 12/29/2005 Zenith Electronics Corporation 2000 Millbrook Drive Lincolnshire, IL 60069			EXAMINER NGUYEN, DUC M	
			ART UNIT 2685	PAPER NUMBER

DATE MAILED: 12/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/863,709	<b>Applicant(s)</b> DOBROVOLNY, PIERRE	
	<b>Examiner</b> Duc M. Nguyen	<b>Art Unit</b> 2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 1-11 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13, 18 and 22 is/are allowed.
- 6) ☒ Claim(s) 12, 14 and 15 is/are rejected.
- 7) ☒ Claim(s) 16, 17 and 19-21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

This action is in response to applicant's response filed on 10/19/05. Claims 12-22 are now pending in the present application. **This action is made final.**

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim **12** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Friesen et al** (US 5,428,839) in view of **Woodward** (US 3,678,418).

Regarding claim **12**, Friesen discloses a broad band RF double balanced mixer circuit comprising :

- a source of symmetrical LO signal (see Fig. 5 and col. 5, lines 35-40);
- a switching circuit controlled by said LO (see Fig. 5, ref. 45, wherein it would be obvious that the diodes 46-49 provide switching functions that are controlled by the LO signal);
- a source of RF signal (see Fig. 5, ref. 51);
- a printed circuit board with wideband RF response and narrow IF signal (see col. 7, lines 55-60, wherein it is clear that MMIC fabrication is the printed circuit board). Here, since Friesen discloses the RF and LO frequency range

is about 20 Ghz (between 20 and 40 Ghz) and the IF frequency range is about 10 Ghz (between 2 and 12 Ghz), it would have been obvious that the above mixer provides a wideband RF response and narrow IF signal as claimed. Therefore, the claimed limitation is made obvious by Friesen, for providing a printed circuit board having a narrow band IF signal.

As to the newly added limitation regarding a printed balun, it is noted that since Friesen discloses that the power divider 70 which can be any three port elements that can provide signal combining, and since a balun is also a three port elements that provides signal combining (i.e, combine two balanced output to a single-ended unbalanced output), it would have been obvious to one skilled in the art at the time the invention was made to modify Friesen to utilizing a balun in place of the power divider 70 as well. Further, providing a printed balun is known in the art as disclosed by Woodward (see Fig. 1 and Abstract), it would have been obvious to one skilled in the art at the time the invention was made to incorporate Woodward's teaching to Friesen to provide a printed balun as claimed, so that the mixer circuit in Friesen could be implement in large scale integrated circuit, for light weight and low cost offered by MMIC capability.

2. Claims **12, 14-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Andrys et al** (US 6,057,714) in view of **Kruger** (US **5,006,811**).

Regarding claim **12**, **Andrys** discloses a wideband RF double balanced mixer circuit comprising :

- a source of symmetrical LO signal (see Fig. 1, and col. 2, lines 1-2, wherein the differential LO is the symmetrical LO signal);
- a switching circuit controlled by said LO (see Fig. 1, refs. 34, 36, wherein it would be obvious that the FETs 30-32, 34-36 provide switching functions that are controlled by the LO signal);
- a source of RF signal (see Fig. 1, ref. 14);
- a printed circuit board with wideband RF response (see col. 2, lines 30-45, wherein it is clear that IC is the printed circuit board, see col. 1, lines 42-43).

Here, although Andrys is silence on the narrow band of the IF signal, it is noted that since Andrys discloses tuned elements 50, 52, 54, 56 at the IF output ports (see Fig. 1) and also mentioned the narrowing of the IF bandwidth (see col. 4, lines 64-col. 5, lines), it is clear that the above tuned elements would cause a narrow band response on the IF signal as disclosed by **Kruger** (see col. 4, lines 48-57 regarding frequency blocking). Therefore, the claimed limitation is made obvious by Andrys and Kruger, for providing a printed circuit board having a narrow band IF signal. Further, providing a printed balun is well known in the art, it would have been obvious to one skilled in the art at the time the invention was made to modify Andrys to provide a printed balun as claimed, so that the mixer circuit in Andrys could be implemented in large scale integrated circuit, for light weight and low cost offered by MMIC capability.

Regarding claim **14** , the claim is rejected for the same reason as set forth in claim 12 above. In addition, it is clear that the FETs 30-32, 34-36 would read on switches and control terminals as claimed (see Fig. 1, refs. 30, 32, 34, 36).

Regarding claim **15**, the claim is rejected for the same reason as set forth in claim 15 above. In addition, it would have been obvious to use MESFET devices as disclosed by Andrys (see col. 3, lines 7-9).

### ***Allowable Subject Matter***

3. Claims 16-17, 19-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
4. Claims 13, 18, 22 are allowed.
5. The following is a statement of reasons for the indication of allowable subject matter: As to claims 13, 18, 21, 22, the cited prior art fails to disclose or make it obvious a method or apparatus for a double balanced mixer which comprises components as specified in the claims.

### ***Response to Arguments***

6. Applicant's arguments with respect to claims 12-22 have been considered but are moot in view of the new ground(s) of rejection.

### **Conclusion**

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US005777527A to **Sander**,

US005732345A to **Vice**,

US004080573A to **Howell**,

US004449245A to **Rabe**.

8. **Any response to this final action should be mailed to:**

Box A.F.

Commissioner of Patent and Trademarks

Washington, D.C. 20231

or faxed to:

(571) 273-8300 (for formal communications intended for entry)

(571)-273-7893 (for informal or draft communications).

Hand-delivered responses should be brought to Customer Service Window,  
Randolph Building, 401 Dulany Street, Alexandria, VA 22314.

Any inquiry concerning this communication or communications from the examiner  
should be directed to Duc M. Nguyen whose telephone number is (571) 272-7893,  
Monday-Thursday (9:00 AM - 5:00 PM).

Or to Edward Urban (Supervisor) whose telephone number is (571) 272-7899.

Duc M. Nguyen

Dec 22, 2005

